

Claims

What is claimed is:

1. A multi-channel filtering system for use in a transceiver having a receive channel and a transmit channel, the multi-channel filtering system comprising:

a front-end multi-pole, multi-throw switch, comprising:

a front-end receive pole configured to couple to the receive channel at a first location thereof;

a front-end transmit pole configured to couple to the transmit channel at a first location thereof; and

a plurality of front-end throws, wherein the front-end receive pole is switchably coupled to one of the front-end throws, and wherein the front-end transmit pole is switchably coupled to one of the front-end throws;

a back-end multi-pole, multi-throw switch, comprising:

a back-end receive pole configured to couple to the receive channel at a second location thereof;

a back-end transmit pole configured to couple to the transmit channel at a second location thereof; and

a plurality of back-end throws, wherein the back-end receive pole is switchably coupled to one of the back-end throws, and wherein the back-end transmit pole is switchably coupled to one of the back-end throws; and

a plurality of filters interposed between the front-end and back-end multi-pole, multi-throw switches, each of the plurality of filters having a first port coupled to one of the front-end switch throws and a second port coupled to one of the back-end switch throws.

2. The multi-channel filtering system of claim 1, wherein the front-end and back-end multi-pole, multi-throw switches comprise two-pole, multi-throw switches.

3. The multi-channel filtering system of claim 1, wherein two or more of the plurality of filters comprise filters of different bandwidths.

4. The multi-channel filtering system of claim 3, wherein at least one of the plurality of filters comprises a bandpass filter.
5. The multi-channel filtering system of claim 2, wherein each of the front-end and back-end multi-pole, multi-throw switches comprise two throws.
6. The multi-channel filtering system of claim 1, wherein the front-end and back-end multi-pole, multi-throw switches each comprise a control signal input for receiving a switch command signal operable to select which switch pole is coupled to which switch throw.
7. The multi-channel filtering system of claim 6, further comprising a switch controller having an input, a first output coupled to the input of the front-end multi-pole, multi-throw switch, and a second output coupled to the input of the back-end multi-pole, multi-throw switch, the switch controller operable to receive a switch command, and to output, in response, a first switch control signal, and a second switch control signal.
8. The multi-channel filtering system of claim 7, wherein each of the front-end and back-end multi-pole, multi throw-switches comprises FET switches.
9. The multi-channel filtering system of claim 8, wherein each of the plurality of filters comprises a bandpass filter.
10. The multi-channel filtering system of claim 9, wherein the front-end and back-end multi-pole, multi-throw switches and the switch controller are fabricated using photolithographic semiconductor processing techniques.
11. A transceiver having a transmit channel and a receive channel, the transceiver comprising:
a transceiver front-end, comprising:

a receive channel frequency converter having a first input for receiving a communication signal, a second input for receiving a reference signal, an output for providing a second receive signal comprising a frequency-translated version of the received communication signal; and

a transmit channel frequency converter having a first input for receiving a second transmit signal, a second input for receiving a reference signal, and an output for providing a carrier frequency signal comprising a frequency-translated version of the second transmit signal; and

a multi-channel filtering system coupled to the receive channel frequency converter and the transmit channel frequency converter, the multi-channel filtering system comprising:

a front-end multi-pole, multi-throw switch, further comprising:

a front-end receive pole coupled to the output of the receive channel frequency converter;

a front-end transmit pole coupled to the input of the transmit channel frequency converter; and

a plurality of front-end throws, wherein the front-end receive pole is switchably coupled to one of the front-end throws, and wherein the front-end transmit pole is switchably coupled to one of the front-end throws;

a back-end multi-pole, multi-throw switch, further comprising:

a back-end receive pole coupled to the receive channel;

a back-end transmit pole coupled to the transmit channel; and

a plurality of back-end throws, wherein the back-end receive pole is switchably coupled to one of the back-end throws, and wherein the back-end transmit pole is switchably coupled to one of the back-end throws; and

a plurality of filters interposed between the front-end and back-end multi-pole, multi-throw switches, each of the plurality of filters having a first port coupled to one of the front-end switch throws and a second port coupled to one of the back-end switch throws.

12. The transceiver of claim 11, wherein the receive channel frequency converter and the transmit channel frequency converter are coupled to a common frequency source.

13. The transceiver of claim 12, wherein the common frequency source is frequency variable.

14. The transceiver of claim 12, wherein the frequency source is a fixed frequency source.

15. The transceiver of claim 11, wherein the receive channel frequency converter comprises a downconverter circuit, and the transmit channel frequency converter comprises an upconverter circuit.

16. The transceiver of claim 11, further comprising a transceiver back-end, the transceiver back-end comprising:

a receive channel second frequency converter having a first input for receiving the second receive signal, a second input for receiving a reference signal, an output for providing a third receive signal comprising a frequency-translated version of the second receive signal; and

a transmit channel frequency converter having a first input for receiving a first transmit signal, a second input for receiving a reference signal, and an output for providing the second transmit signal comprising a frequency-translated version of the first transmit signal.

17. The transceiver of claim 16, wherein the receive channel second frequency converter comprises a downconverter circuit, and the transmit channel second frequency converter comprises an upconverter circuit.

18. The transceiver of claim 16, wherein the receive channel frequency converter comprises an upconverter circuit and the receive channel second frequency converter comprises a downconverter circuit.
19. The transceiver of claim 11, wherein the front-end and back-end multi-pole, multi-throw switches comprise two-pole, multi-throw switches.
20. The transceiver of claim 11, wherein two or more of the plurality of filters comprise filters of different bandwidths.
21. The transceiver of claim 20, wherein at least one of the plurality of filters comprises a bandpass filter.
22. A multi-channel filtering system for use in a transceiver having a receive channel and a transmit channel, the multi-channel filtering system comprising:
- a front-end two-pole, multi-throw switch, comprising:
 - a front-end receive pole configured to couple to the receive channel at a first location thereof;
 - a front-end transmit pole configured to couple to the transmit channel at a first location thereof; and
 - a plurality of front-end throws, wherein the front-end receive pole is switchably coupled to one of the front-end throws, and wherein the front-end transmit pole is switchably coupled to one of the front-end throws;
 - a back-end two-pole, multi-throw switch, comprising:
 - a back-end receive pole configured to couple to the receive channel at a second location thereof;
 - a back-end transmit pole configured to couple to the transmit channel at a second location thereof; and
 - a plurality of back-end throws, wherein the back-end receive pole is switchably coupled to one of the back-end throws, and wherein the back-end transmit pole is switchably coupled to one of the back-end throws; and

a plurality of filters interposed between the front-end and back-end multi-pole, multi-throw switches, each of the plurality of filters having a first port coupled to one of the front-end switch throws and a second port coupled to one of the back-end switch throws.

23. The multi-channel filtering system of claim 22, wherein two or more of the plurality of filters comprise filters of different bandwidths.

24. The multi-channel filtering system of claim 23, wherein at least one of the plurality of filters comprises a bandpass filter.